

Abstract

The present invention provides a semiconductor device structure and an easy-to-use method for manufacturing thereof enabling to suppress
5 wafer contamination and to form the semiconductor device superior in control and uniformity of the film thickness in the semiconductor device including plural kinds of transistors provided with a gate insulator film with different film thickness.

According to the method, plural kinds of transistors with gate insulator
10 films having different electric film thickness are formed in the steps of

forming an insulating film layer including a lamination structure of at least first insulating film 104 constituted of first high-dielectric insulating material and second insulating film 103 constituted of second
high-dielectric insulating material on the same silicon substrate 101,

15 selectively etching and removing the upper insulating film 103 on the part of region 105 by use of mask 107 and utilizing multi-oxide process while reducing leak electric current.